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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/092,394	03/05/2002	Ioannis Katsavounidis	INTV.016A	8443
4586	7590	04/19/2005	EXAMINER	
ROSENBERG, KLEIN & LEE 3458 ELLICOTT CENTER DRIVE-SUITE 101 ELLICOTT CITY, MD 21043			AN, SHAWN S	
			ART UNIT	PAPER NUMBER
			2613	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/092,394	Applicant(s) KATSAVOUNIDIS ET AL.	
	Examiner Shawn S An	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 24-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-12 and 24-28 is/are rejected.
- 7) ☒ Claim(s) 5, 6 and 13-15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/4, 10/7, 10/22/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Restriction/Election

1. Applicants' election without traverse of species III corresponding to claims 1-15 and 24-28 in the reply filed on 12/27/2004 is acknowledged. Furthermore, Applicant has canceled claims 16-23 and 29-30.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (5,617,149) in view of Hirzalla et al (6,415,000 B1).

Regarding claims 1 and 8, Lee et al discloses a method of detecting a scene change in a digital video sequence having a plurality of frames, comprising:

calculating a first mean absolute difference (MAD) value for the first frame relative to the second frame (Fig. 1, 1);

determining if the first MAD value meets a second criterion (2, a second threshold); and

designating the second frame as a scene change frame at least partly in response to determining the first MAD value meets the second criterion (3) (see also Fig. 2).

Lee et al does not specifically disclose calculating a first root means squared (RMS) value for a first frame to a second frame, and the second frame to a third frame, determining if the first RMS value meets a first criterion, and designating the second

frame as a scene change frame at least partly in response to determining the first RMS value meets the first criterion.

However, Hirzalla et al teaches a method of processing a video stream comprising calculating a difference value between the first and the second frames of the pair, determining if the difference value meets a first criterion (difference value > a first threshold), and designating a frame as a scene change (cut) frame at least partly in response to determining the difference value meets the first criterion (col. 1, lines 45-62).

Furthermore, Hirzalla et al teaches that the difference value can be calculated by taking the root mean square of the differences in pixel values (RMS value) (col. 1, lines 63-67; col. 2, lines 1-5).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing a method of detecting a scene change as taught by Lee et al to incorporate the concepts as discussed above as taught by the Hirzalla et al so as to calculate a first root means squared (RMS) value for a first frame to a second frame, and the second frame to a third frame, determine if the first RMS value meets a first criterion, and ultimately designate the second frame as a scene change frame at least partly in response to determining the first RMS value meets the first criterion and the first MAD value meets the second criterion as an accurate method to detect scene change, thereby avoiding/reducing false scene change detections.

Regarding claim 2, the Examiner takes official notice that a RMS value having a color weight is well known in the art. Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing a method of detecting a scene change to utilize color weight as an efficient way to derive a RMS value.

Regarding claim 3, the Examiner takes official notice that when a scene change is detected, then the frame that's being designated as the scene change frame is normally encoded as an I frame, then followed by P (predictive) and B (bidirectional) frames.

Therefore, it would have been obvious to store an I-frame designation in a file for the second frame (scene change frame), and storing P-frame designation for a third frame in the file to be compatible with the traditional GOP (group of pictures/frames) set.

Regarding claim 4, Hirzalla et al teaches the RMS value being based at least part on pixel luminance (intensity) values of the first and the second frames (col. 1, lines 63-67).

Therefore, it would have been obvious to utilize both luminance and chrominance (color) values of the first and the second frames as an alternative way to calculate the first RMS value.

Regarding claim 7, Hirzalla et al teaches the RMS value being calculated using pixel luminance (intensity) values and excluding chromaticity components (col. 1, lines 63-67).

4. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirzalla et al (6,415,000 B1).

Regarding claim 9, Hirzalla et al discloses a method of detecting a scene change in a digital video sequence having a plurality of frames, comprising:

calculating a difference value between the first and the second frames of the pair, and based at least partly on the difference value (RMS), determining that the frame is a scene change (cut) frame (col. 1, lines 45-67; col. 2, lines 1-5).

Hirzalla et al does not specifically disclose calculating a second temporal derivative RMS value for a first frame relative to a second frame, and the second frame relative to the third frame, and based at least partly on the second derivative value, determining that the second frame is a scene change frame.

However, the Examiner takes official notice that it is conventionally/mathematically well known to calculate a (second) derivative of a value.

Therefore, since Hirzalla et al already discloses the concept of determining a scene change based on a RMS value as discussed above, it would have been obvious to a person of ordinary skill in the relevant art employing the method of detecting a scene change as taught by Hirzalla et al to incorporate the Examiner's official notice

so as to calculate a second temporal derivative RMS value for a first frame relative to a second frame, and the second frame relative to the third frame, and based at least partly on the second derivative value, determining that the second frame is a scene change frame as an accurate method to detect scene change, thereby avoiding/reducing false scene change detections.

Regarding claim 10, substantially all of the limitations has been addressed by the Lee et al reference (5,617,149) as discussed above. Therefore, the Examiner takes official notice that it would have been obvious to incorporate Lee et al teachings as an alternative efficient way to detect scene change.

Regarding claim 11, it is considered an obvious design choice to set the RMS value to be a certain value, and also incorporate the second criterion as an alternative efficient way to determine that the second frame is a scene change frame, thereby avoiding/reducing false scene change detections.

Regarding claim 12, Hirzalla et al discloses comparing the difference value (RMS) to a threshold, then subsequently identifying scene change, in a case that the difference value (RMS) exceeds a predetermined threshold (abs.).

Therefore, it would have been obvious for the second RMS value to be greater than or equal to a first threshold so as to determine that the second frame is a scene change frame.

5. Claims 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (6,118,817) in view of Lee et al (5,617,149).

Regarding claims 24 and 26, Wang et al discloses a method of determining which portions of video sequence are to be intracoded, comprising:

- calculating a RMS value for a first portion of the video sequence (frames including a first frame) (Fig. 10, 1002; col. 17, lines 22-37);

- calculating a first absolute (pixel) difference value for a first portion of the video sequence (Fig. 5, 502);

- determining if the first RMS value meets a first criterion (Fig. 10, 1006);

determining if the first absolute (pixel) difference value meets a second criterion (Fig. 5, 506);

determining if the first absolute (pixel) difference value meets a third criterion (Fig. 7, 704; Fig. 5, 510); and

causing an intracoding operation to be performed at least partly in response to at least two of the first-third criteria being met (Fig. 6, 608).

Wang does not specifically disclose calculating a first mean absolute difference (MAD) value for a first portion of the video sequence.

However, Lee et al teaches a method of processing a video stream comprising: calculating a first mean absolute difference (MAD) value for a first portion of the video sequence (Fig. 1, 1);

determining if the first MAD value meets a second criterion (2, a second threshold); and

designating a scene change frame at least partly in response to determining the first MAD value meets the second criterion (3) (see also Fig. 2).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing a method of determining which portions of video sequence are to be intracoded as taught Wang to incorporate the concepts as discussed above as taught by Lee et al so as to calculate a first mean absolute difference (MAD) value for the first portion of the video sequence, and determine if the first MAD value meets the second criterion or the third criterion, thereby causing the intracoding operation to be performed at least partly in response to at least two of the first-third criteria being met as an efficient way to encode the video sequences.

Regarding claim 25, it is considered an obvious design choice to set the MAD value to be a local maximum value as long as the value contributes to an efficient encoding process.

Regarding claims 27-28, GOP and GOV terms are conventionally well known terms used in a video encoder.

GOP – group of pictures/frames (encoded order starts with an I picture and ends with picture immediately before the next I-picture in the video sequence).

GOV – group of video plane layers (similar to GOP).

Therefore, it would have been quite obvious to include a first GOP and/or GOV as the first portion of the video sequence.

Allowable Subject Matter

6. **Claims 5-6 and 13-15** are objected to as being dependent upon a rejected base claims 1 and 9, respectively, but would be allowable: if claim 5 is rewritten in independent form including all of the limitations of the base claim 1 and any intervening claims; and if any one of the claims 13-15 is rewritten in independent form including all of the limitations of the base claim 9 and any intervening claims.

Dependent claims 5-6 and 13-15 recite novel features, wherein the art of records fail to anticipate or make obvious the novel features.

Accordingly, if the amendments are made to the claims listed above, and if rejected claims are canceled, the application would be placed in condition for allowance.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to *Shawn S An* whose telephone number is 571-272-7324.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

9. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



SHAWN AN
PRIMARY EXAMINER

4/13/05